INPUT

STRATEGIC MARKET PERSPECTIVE

Federal Document Management Systems 1995–2000

Federal IT Market Analysis Program

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Abstract

Until recently, Document Management, Imaging and Workflow products have been marketed by a vendor's direct sales force. Today, vendors benefit from significant distribution channels which result in greater competition for document imaging contracts and lower costs to the agency. INPUT estimates that the Federal Document Management Systems market will grow from approximately $813M in FY95 to $1.2B in FY96. This is a Compound Annual Growth Rate (CAGR) of 7%.

This report examines the document management market in the federal government, analyzing document management requirements and programs of federal agencies. The objectives of the report are four fold:

- to investigate the state of the document management technology today

- to review past contract objectives of federal agencies

- to examine active federal contracts for document management products and services

- to forecast trends in this market segment.

This report contains 68 pages and 17 exhibits.

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Table of Contents

Exhibits

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I

Introduction

Reinventing government, providing increased information access to the public, while reducing staff, has increased the challenge of managing documents and images within the Federal Government. Document imaging will continue to grow as one of the major technical challenges for network information managers throughout the 90s. Until recently, solutions to the document management challenge involved proprietary systems with significant costs. Agencies also were locked into solutions that were single platform in nature. The information could be routed between work groups but not between departments or other agencies. The arrival of a new generation of enabling applications has changed this dramatically. Now agencies choose applications that fit into their current network, cross platforms and provide comprehensive low-cost solutions. These "open" applications have been designed to use standard relational databases and common communication platforms.

"Component software" product solutions provide powerful search-and-retrieval engines, and workflow components for finding, managing and routing electronic documents over an enterprise network. Public access to these documents also can be accomplished through the use of the Internet. The market distribution of these products to the government also has had a significant impact in its ability to automate many of its paper systems. The government has been operating, and will continue to operate, with limited funding.

Until recently, Document Management, Imaging and Workflow products have been marketed by a vendor's direct sales force. Today, vendors benefit from significant distribution channels, resulting in greater competition for document imaging contracts and lower costs to the agency.

A

Scope

This report examines the document management market in the federal government, analyzing document management requirements and programs of federal agencies. Recently awarded contracts and future contract opportunities were analyzed. Agency officials and document management vendors were interviewed.

B

Objectives

The objectives of this report are fourfold: 1) to investigate the state of the document management technology today, 2) to review past contract objectives of federal agencies, 3) to examine active federal contracts for document management products and services and 4) to forecast trends in this market segment.

C

Methodology

INPUT analysts reviewed the Office of Management & Budget/General Services Administration (OMB/GSA) Five-Year Plan and the INPUT Procurement Analysis Reports for document management programs initiated during fiscal years 1995–1999. INPUT also examined agency A-11 submissions for fiscal years 1995 and 1996 for additional information on document management requirements embedded in distributed data processing and office automation programs. The available agency long-range Automated Data Processing (ADP) plans for fiscal years 1994–1998 and 1995–1999 were reviewed to identify plans for forthcoming major document management, document imaging and workflow systems and services contracts. INPUT developed questionnaires for interviewing federal agency officials and document management products and services vendor executives. The agency questionnaire was designed to obtain information concerning plans for future use of document management systems and services. The vendor questionnaire was designed to obtain information about current and future plans from major vendors of document imaging and management products and services. Both questionnaires included questions about contracting policy and preference, technical standards and vendor performance perceptions. Federal agency officials selected for interviews included policy makers as well as program managers (users). Vendor representatives selected for interviews included company executives and marketing personnel.

D

Report Organization

I-3

Following this introduction, the report is divided into five sections:

Chapter II, entitled Executive Overview, summarizes the major points and findings in the report.

Chapter III, entitled Document Management Systems, discusses the market characteristics and activities.

Chapter IV, entitled Federal Market Analysis and Forecast, includes INPUT's analysis of the document imaging and management sectors of the Federal Information Technology Budget for fiscal years 1995 through 2000. This chapter also addresses major market factors, agency forecasts, and vendor shares in various market segments.

Chapter V, entitled Summary, provides commentary on agency directions, key regulation and policy agencies, and on agency plans for acquiring document management systems. The chapter also includes a discussion of current standards, protocols, and compatibility issues in the federal document management market.

Three appendixes also are provided:

A.   Federal Opportunities

B.   Federal Clearing House Libraries

C.   Glossary of Acronyms.

E

Related Reports

Related reports of interest to the reader are as follows:

Agency Recompete Practices in SETA and SO Contracts

Defense CIM Information Services Market

Federal Agency Recompete Practices

Federal Computer Security Market, 1995-2000

Federal Electronic Commerce/EDI Market

Federal Information Technology Procurement Program, Procurement Analysis Reports

Federal Systems Integration Market, 1992-1997

Service to the Citizen Market

Object-Oriented Technologies in the Federal Market - 1993

Client/Server Trends in the Federal Market - 1994

Federal Information Systems and Services Market, 1995-2000

Business Process Re-engineering in the Federal Government

Federal Imaging Market - 1994

Federal E-Mail Market - 1994

Federal High-Performance Computing 1994-1999

Federal Telecommunications Market, 1994-1999

II
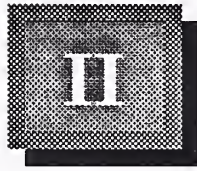
Executive Overview

A

Management Perspective

Document Management Systems in the information management age are forcing government agencies to become efficient and effective by allowing them to access and process information faster than ever. Agencies traditionally have been paper-intensive organizations and have had great difficulty storing and using documents. Imaging, Document Management and Workflow systems offer agencies a cost-effective way to improve the services they provide.

Exhibit II-1

DOCUMENT MANAGEMENT SYSTEMS, FY 1995–2000
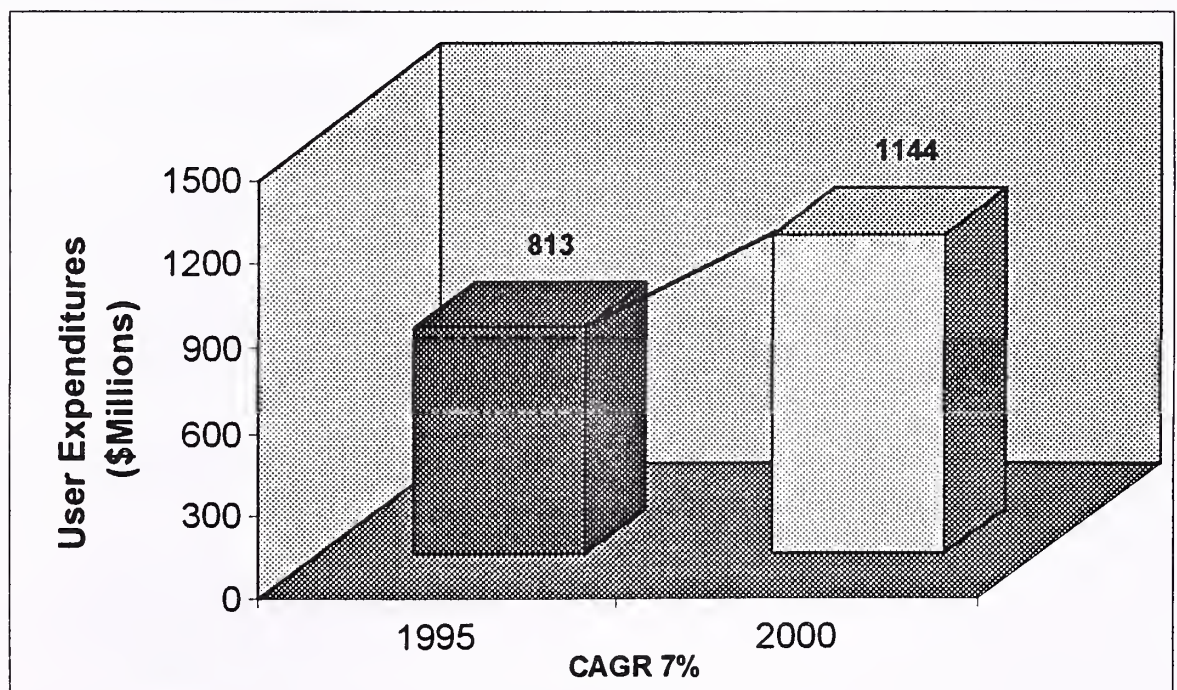
Source: INPUT

Exhibit II-1 demonstrates that the projected use of document management systems in the federal sector will grow from over $.8 billion in FY 1995 to almost $1.2 billion by fiscal year 2000. This is a growth rate of 7%. This compares to a compounded growth rate of total contracted portion of the federal Information Technology (IT) market.

Civilian agencies will outspend the U.S. Department of Defense (DoD) by a factor of 2.5 to 1 in Document Management Systems. This growth is the result of government downsizing and the fact that Document Management Systems are total system solutions. They now encompass workflow, text retrieval and electronic publishing systems. Agencies also now are replacing their legacy based paper systems in an effort to streamline their organizations.

It is not uncommon for some federal agencies to face budget cuts approaching 40% and still face the prospect of providing increased services. The only area many agencies can cut is in human resources. Therefore, technology is leading the way in reengineering the agency to fill the gap. Document Management Systems provide for lower operating costs, improved information availability and reduced storage costs. They also allow for the implementation of enterprise-wide solutions.

The impact of the information highway also is being addressed by the implementation of Document Management Systems. Many of the systems available today support the "World Wide Web" and other "Gophers" thus giving the agency increased flexibility in providing information to the public.

Other findings in this report cover:

- Competitive "Open Based" systems solutions. These systems cut acquisition cost and reduce long term maintenance costs of systems.

- Desktop and workgroup server configurations now are being integrated into existing agency networks while leaving hooks for upcoming upgrades.

- Data access and interchange allow agencies to share information across platforms and between agencies.

- Agencies will be forced to support implementation projects with more highly trained staff members

- These implementation projects require more front end analysis, more project management skills, training, and ongoing technical support for upgrades.

- End-user involvement is greater and will resolve many operational issues.

B

Matching Capabilities to Needs

By forcing vendors to bid component software solutions, users are assured that their functional capability needs will be met in a cost-effective manner. However, this will force the vendors to find more innovative methods to present their solutions to the end user. They will also have to understand the end requirements more closely than ever before. Vendor support of the customer also will increase and allow one system integrator to stand out from the other.

Obstacles faced by federal users will be a continuation of many of the same issues they currently are addressing:

- Limited funding and downsizing constraints

- Network limitations

- A need to replace antiquated hardware

- Greater involvement of end-users in the design and selection processes

- Increased training requirements

- Version control

- Document security concerns

- A solution to keeping abreast of the rapidly changing technology capabilities.

- System/network capacity, performance

- Data standardization

- The advancement of the information highway

Exhibit II-2

Exhibit II-2 depicts the interaction of the Document Management Systems components.

A PROFILE OF DOCUMENT MANAGEMENT SYSTEMS

DOCUMENT
CONTROL

Filtering

SGML
(Format Control)

Full Text Index

Version Control

Portable Format

INTERFACES

Multi-Platform
(Open Ended)

Security

Tagging

Open Doc Link

Mail Links

SQL Links

IMAGE CONTROL

Scan

Annotation

Workflow

Compression

Thumbnails

Optical Media
Support

Source: INPUT

III
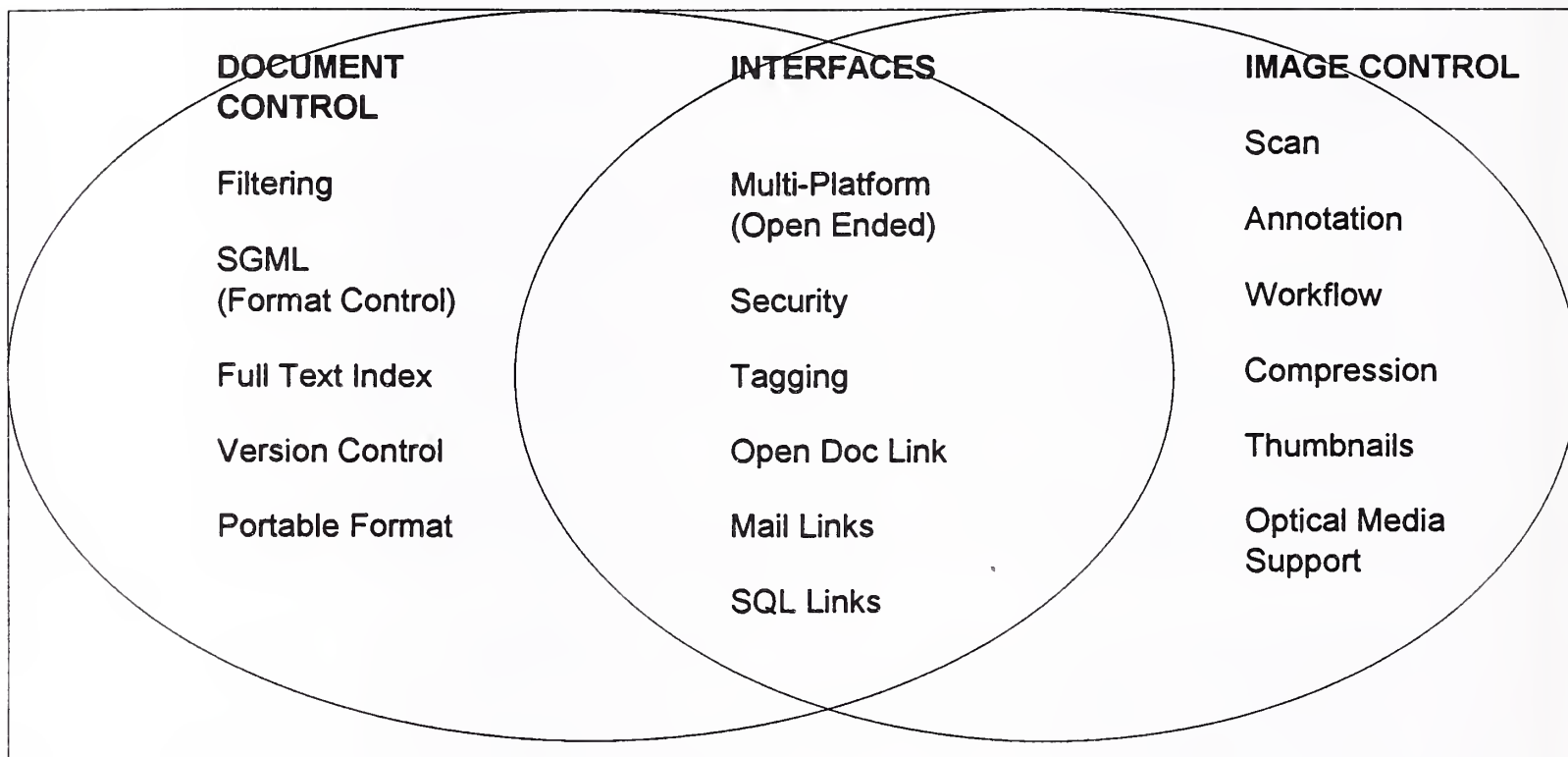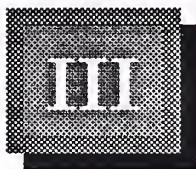
Document Management Systems

A

Definition of Systems & Functional Overview

A document is a collection of related data elements that, when combined, records and reports information to an end user. These informational elements can be in the form of a word processing document, a spreadsheet, a graphic image, a voice file or an electronic image of a paper document. Document Management Systems today record the current state of the document, as well as the history of a document's life. They also provide a method of locating a document, controlling access, tracking versions of documents and archiving documents. These systems include a front end Application Programs Interface (API) to customize handling and controlling all types of documents. Each document is described by a number of structures, principally the profile. Through these structures, users share, edit, organize information, save and archive documents.

The Document Management Systems on the market today are Open in nature. They are integrated tightly with leading DOS, Windows, Macintosh, and UNIX applications such as Microsoft Word, WordPerfect, Ami Pro, Excel and E-mail packages. They also have an API to allow users and integrators to communicate directly with fax servers, imaging, workflow and text publishing products using the Internet.

The Document Profile Structure

Each of the products on the market today contains its own document profile for describing it throughout its life cycle. The list below describes the information that helps organize and define documents:

– *Profile* - The profile is a record that describes the attributes of the document, and is used as the principal searching mechanism. The profile is like a library card, with common classification information about all documents. Often the term metadata is used to describe a profile.

– *Version* - Each document can have versions. A user wishing to save previous work, and to begin new edits, creates a new version. When older versions are edited, a sub-version is created.

– *Attachment* - Each document can have any number of attachments, which are essentially response documents, or related documents. Examples are notes on a project, or automatic redline results.

– *Component* - Each version may be made up of multiple components. A component is a pointer to the electronic file in which the document is stored. Some products, such as imaging applications, store multiple files for each document, and multiple components would be created.

– *Document History* - All document activity is logged in an audit trail, known as the history. This includes retrieves, saves, copies, etc.

The Library

All Document Management Systems organize documents into physical collections, called libraries. Typically, each physical site in a wide area network installs at least one library. Physically, libraries are usually SQL-based database servers. Each library handles a group of users whose size is determined by the capabilities of the database engine, hardware, and memory that is available. Some Document Management Systems run several hundred users on a single library, and several thousand users across a wide area network on multiple libraries. Users see the entire network as a set of easily accessible document collections.

A library consists of three components:

– *Document Servers* - The document server is a file server that holds the electronic files stored in the Document Management System. NetWare, Banyan, NT Server, LAN Manager, and UNIX are all examples of operating systems that run on document servers.

– *Library Servers* - Libraries are installed on library servers. The library server consists of a Relational Data Base Management Systems (RDBMS) running on a server. Multiple logical libraries can be installed on a single library server.

– *Full Text Index Servers* - Each library optionally can store a real-time index of text in each document. This index can be used for rapid content searches across the enterprise. The full text index typically is stored on a file server.

Today's Document Management Systems provide a multi-library folder capability that allows users to place static lists of documents and folders in a named container. Groups of users can share this hierarchical organization of documents as well. These folders can then be shared throughout the enterprise.

B
Architectural Overview

Because document management is such a pervasive component of an enterprise network, the architecture is a critical criterion for evaluation of products. Most of the Document Management Systems on the market today are built according to the latest standards in architecture. In addition, these products are being updated continually to take advantage of technological advances.

Document Organization and Control Systems are built on several fundamental assumptions:

• Networks inevitably grow in complexity.

• Large networks are inherently multi-platform.

• Technology is constantly changing.

• The resources to manage a network are scarce.

These assumptions guide the tools used to build an enterprise Document Management System. The goal is to provide a homogenous view of a heterogeneous environment. In order to understand the parts, one should understand the whole.

Anatomy of a Document Management Library

The purpose of the library is to give the user a logical view of the organization's documents, rather than the physical view found in the Windows, DOS or Mac OS operating systems. The layout in Exhibit III-1 represents the layout of a typical library on a medium-sized local area network:

Exhibit III-1

Document Management Library
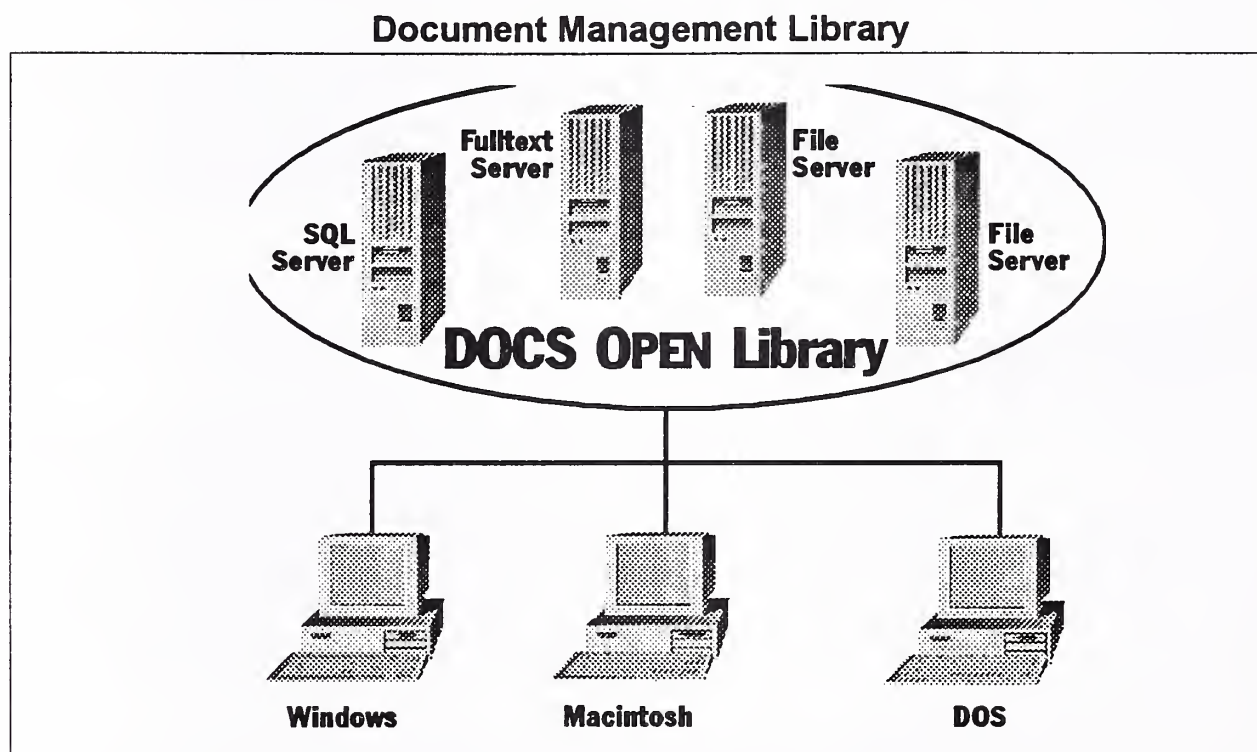
Source: INPUT

The Library Server consists of a Structural Query Language (SQL) database, any number of network file servers, a full text server and Windows, Macintosh or DOS workstations.

Large or Complex Network Environments

When a network has many users, most likely there will be multiple servers and multiple sites. In this case, because of physical proximity, or limitations of the hardware and operating systems, it may be necessary to install multiple libraries. Document Management Systems are designed to grow incrementally, along with the organization. Once a single library server has been installed, new libraries can be brought on-line quickly using built-in library replication tools. Once installed, all users can search and retrieve documents from any library as if the whole network were one monolithic system.

Access to Features Unique to the Platform

In many multi-platform products, only the minimum features are supported in order to make the products as generic as possible. Value added resellers often add features using C++ classes, then build an abstract enterprise model of the ultimate network and database platform, and then map these concepts into the unique features of each platform. The result is a unique application solution that can run on the organization's multi-platform environment, and be able to retrieve documents stored across the organization's platforms.

- *Stored Procedures* - Document Management Systems use stored procedures for enhanced performance on Sybase, Informix, Oracle or another DBMS.

- *File Level Security* - They add file-level access control lists on network operating systems that support them: NetWare, LAN Manager, NT Server, and Banyan Vines.

- *Directory Synchronization* - They import the user and group directory from network operating systems that provide API access: NetWare, LAN Manager, NT Server, and Banyan Vines.

C

Multi-Platform Environments

Today's enterprise networks inevitably are multi-platform environments, incorporating a wide range of hardware, operating systems and database products even within the same site. Not all of the Document Management Systems today are designed specifically to handle complex, multi-platform environments. Many value-added resellers have to create an object-oriented, abstract view of a Wide Area Network (WAN), and develop custom drivers for all of the supported platforms, and their unique features. This is often the source of many consulting opportunities for the value-added resellers.

Supported Client Workstations

Document search and retrieval happens within applications through integration with document capture, authoring and viewing tools. For this reason, Document Management Systems place the individual logic processing of documents with the client, with access

to shared document libraries where needed. By having a centralized repository for the WAN, these systems can deliver documents to multiple client platforms, including:

- Microsoft Windows, Windows for Workgroups, Windows NT, and in Windows 95.

- MS-DOS 5.0 and later.

- Macintosh System 7 and MacOS.

- UNIX environments.

Supported Library Servers

A Library Server is a database of profiles, versions and other information describing a document. Document Management System products on the market today support client/server database products on all platforms supported by that vendor. Some examples of these are:

- **Sybase** - Sybase System 10 and SQL Server Version 4 are supported on all platforms, including NT, NetWare NLM, DEC VMS, and several flavors of UNIX.

- **Oracle** - Oracle 7.1 is supported on all platforms, including NT, NetWare NLM, DEC VMS, and several flavors of UNIX.

- **Microsoft** - Microsoft SQL Server for Windows NT.

Supported Document Servers

A Document Server is the physical part of any library that stores the documents in their native format. Document servers are either network file servers or the local hard drive. Document Management Systems are either DOS based or usually support any Windows-compatible network file system. Exhibit III-2 shows some of the different platforms, and the features supported on each. Each specific vendor's product will have different capabilities:

Exhibit III-2

Supported Document Servers by Major Product Offering

Network Vendor & Product Version	File Level Security Supported	User & Group Directory	OS-Level HSM Support
NetWare 3.11 and 4.X	Yes	Yes	Yes
Banyan Vines 5.5	Yes	Yes	Yes
NT Server 3.5	Yes	Yes	Yes
LAN Manager 2.2	Yes	Yes	Yes
Beame & Whiteside	Yes	Yes	Yes
Sun Select NFS	Yes	Yes	Yes
DEC Pathworks 5.5	Yes	Yes	Yes
LAN Server	Yes	Yes	Yes
Microsoft WFW 3.11	Yes	Yes	Yes

Source: INPUT

D

Standards

Document management vendors in the market today comply with most of the prevailing industry standards in developing their product line. This ensures a longer product life cycle, and a wider range of services. Document Management Systems standards include:

- **Structured Query Language (SQL)** - This is a transaction-based query language for relational databases. Communication with the library server is exclusively through SQL statements.

- **Open Document Management API (ODMA)** - ODMA is an API developed by a consortium of document management and application vendors to standardize integration between different application technologies. ODMA allows application vendors to store and retrieve documents from a document management library.

E

Migration Path for Legacy-Based Application Documents

Document Management System users can organize and control their existing base of documents, regardless of size, with the use of "Document Import" modules. These modules help customers migrate legacy documents into document libraries. They create profiles for existing documents. Profile fields can be populated with variable information, including document content, summary fields of popular word-processing formats, and portions of a subdirectory.

Once documents are imported, older documents can be archived onto optical or magnetic tape using the Storage Management subsystem.

F

Document-Oriented Application Integration

When users are creating or editing documents, they need to focus on their work—not on the technology. This is what application integration accomplishes. By becoming a natural function of the document authoring tool, document management can be as intuitive as running a spell check. Many vendors have incorporated integration strategies with third-party vendors in their products; replacing WordPerfect commands such as Retrieve and Save with their own appropriate commands. This expands integration to a wide range of products, including word processors, spreadsheets, Groupware, and E-Mail.

Users working with documents need to be able to retrieve and save information as quickly as possible. Searching and categorizing new documents are administrative steps that information technology products are meant to reduce. Without a DMS, filing documents can be confusing, and without a strict system can be nearly impossible in an enterprise environment. Users are similarly hindered when searching for documents because they rarely have any rules they can follow to find the documents, or the training to find documents on remote servers.

In the Windows environment, integration with a document authoring tool generally means replacing the File Open and File Save commands, as well as other file-related commands, with appropriate dialogues from the Document Management System. In addition, with some products, integration with features such as mail merge, document comparison, and cell-linking also are included.

Many of the Document Management System products available today provide customers with "out of the box" integration with document authoring tools. The majority of systems include the following products:

- Lotus Ami Pro

- Microsoft Word for Windows

- Novell WordPerfect

- Lotus 1-2-3

- Microsoft Excel

- Novell Quattro Pro

- Microsoft Project.

For example, when opening a Word document without a Document Management System, the File Open command displays a DOS-based file open dialog. This dialog requires an understanding of the DOS operating system, and of the network topology and subdirectory structure. With even a moderate volume of documents, this can become impossible to manage.

When using an integrated application, the Document Management System replaces the File Open dialog with its own Quick Retrieval dialog box. When a user selects the File Open command, the user is presented with a list of the 30 most recently edited documents, with intelligible names. The user then can press the Search button to use more advanced searches. By trapping the File Open command, the document management functionality becomes a natural extension to the word processor.

G

Compound Documents

A compound document is a document that contains imbedded objects. An example of this is a word-processing file such as Microsoft's Word 6.0 that has a graphic image file, a spreadsheet, and a voice file within it.

The document management products on the market have been built to work with a wide variety of document authoring tools. This is

critical when a user is building a compound document using modern document architectures such as Microsoft's OLE 2.0. In addition, the vendors are working with document object vendors and standards committees to build a comprehensive structure for managing documents that are linked across a wide area network. Already, ODMA is providing such capabilities in several commercial applications. Object Link Embedding (OLE) will be implemented more thoroughly in future document authoring tools. Compound documents can be made up of both embedded and linked components in an enterprise environment.

H

Integration with Groupware Products

Sending Documents as Mail Attachments

Integration with desktop mail systems has become an important document management requirement. Once a draft of a document is completed, users can send electronic copies to coworkers for review and editing. Products are integrated with a number of mail packages using the MAPI or VIM specifications. This includes Microsoft Mail, Lotus Notes, Lotus cc:Mail and Novell Groupware.

A user who is ready to send a document can select the document from a hit list and issue the Document Mail command. Users can send a copy of the native document as an attachment, optionally check out the document with a comment, or send a reference to the document profile.

Lotus Notes

Lotus Notes has become a leading Groupware product, offering on-line communications and information distribution technology to enterprise networks. Lotus Notes differs from document management in several important ways:

- Lotus Notes stores documents in "Notes" databases in "Notes" format. Type fonts are stored in its native format in the file system. Lotus Notes is appropriate for handling a reasonably-sized database of small documents, with some embedded OLE objects.

- Lotus Notes is an application development environment for building specialized message and small document applications.

- Lotus Notes handles inter-network access to data primarily through complete message replication.

I
Custom Integration

Most of the Document Management Systems ship with a turnkey system for handling front office documents. Many government agencies have custom applications that require integrated document management features. This customization is the source of large consulting services for systems integrators. Most systems also have a "Toolkit" available to software developers and integrators who wish to add document control and retrieval functions to their applications. The Toolkit provides integration APIs in the form of Dynamic Library Links, and OLE Automation. All macros and integration modules are supplied by the vendor. The Toolkit makes functionality of Document Management Systems available to both C/C++ and Visual Basic developers.

J
Document Interchange

Many vendors compete for control of corporate information that is stored in electronic form. In most organizations, at least two major desktop applications hold vital, line-of-business information in document form. Each product has its own file format and its own user interface for managing documents of different formats.

Document file information can come from any of the following sources:

- *Electronically Created Documents* - Documents that are created and edited in a word processor or spreadsheet in their native format, then cataloged in a document management library.

- *Scanned Images of Paper Documents* - Paper documents that are converted to an electronic image using a document scanner.

- *Legacy Electronic Documents* - Electronic documents or images that are imported using the File Import commands, or a Document Import Utility.

– *Physical Documents* - Paper documents or other non-electronic objects that are cataloged in the Document Management System, but that have no electronic equivalent content.

Workflow

Workflow has become a popular topic in the business computing industry. Dozens of Independent Software Vendors (ISVs) are introducing innovative products that help customers map, build and track re-engineered business processes. These products range from business process reengineering methodologies to flow charting tools, to rules engines, to process deployment environments.

Most organizations have begun to automate their business processes using technologies other than workflow, such as electronic mail, project management, database applications and Document Management Systems. In many cases, companies have identified the next step to enhancing these business applications to start automating the flow of the information—to whom it goes next and under what conditions.

Customers recognize the need to add basic workflow functionality, such as rules-based routing and document status tracking, to their existing applications—workflow-enabling their current software environments. These customers are not looking to re-engineering totally their business processes, to throw away their investments in their current applications—investments in time, training, legacy information, familiarity, and money. Rather, they want to build upon their existing software solutions, enhancing them to provide necessary workflow management capabilities.

K

Document Life Cycle Management

Today's Document Management Systems provide complete document life cycle management, which entails workflow, records management and storage management features. Though each document management application is as unique as the organization that uses it, there are certain commonalties found in applications that manage mission critical documents, such as pharmaceutical Food and Drug Administration (FDA) applications, agency wide correspondence tracking, and technical instructions for building nuclear submarines. Document Management Systems typically have identified five standard stages of a document life cycle:

- Create

- Review

- Publish

- Archive

- Purge.

While the length of time spent on each stage of the document life cycle changes from document type to document type, each step is vital to maintaining an efficient Document Management System. Managing the first three stages of this life cycle requires workflow capabilities. These capabilities ensure that once the document is created it is routed to the appropriate people for review and that the properly reviewed version of the document is the one that is published.

Exhibit III-3 illustrates the five standard stages of a document life cycle and the features they entail.

Exhibit III-3

Document Life Cycle

CREATE	REVIEW	PUBLISH	ARCHIVE	PURGE

Document Assembly →

Work Management (Workflow) →

Records Management →

Storage Management →
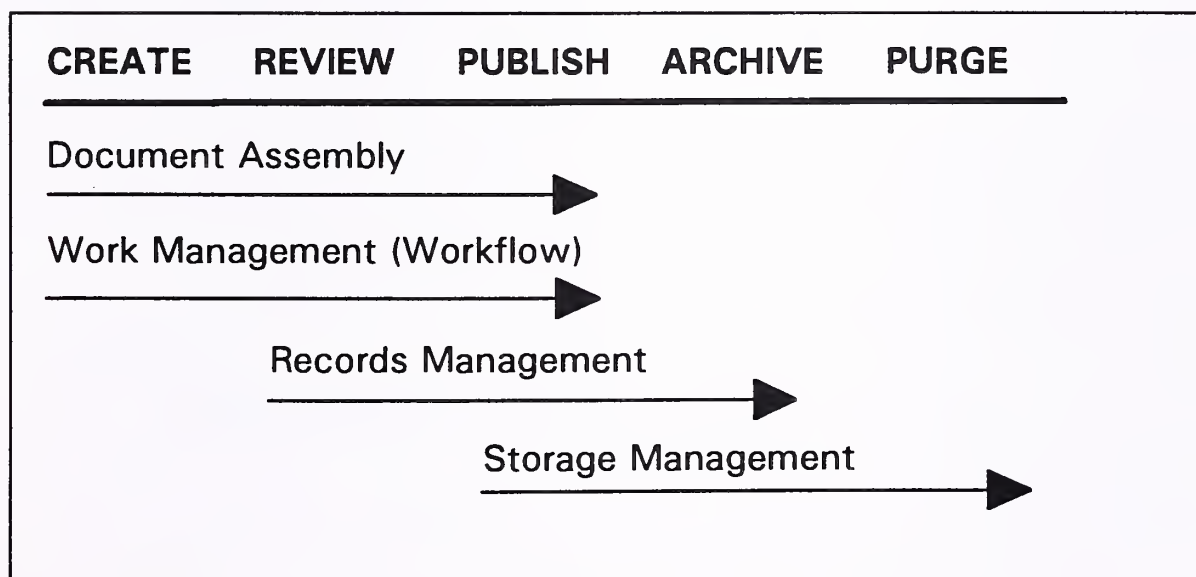
Source: INPUT

Workflow-Enabled Document Management

Most document management vendors have recognized the importance of providing basic workflow capabilities to existing document management applications, and are adding enhanced project management, document routing and status tracking. However, rather than forcing customers to change application development environments to utilize these features, vendors have added functionality to the familiar document management environment. Users will take advantage of these capabilities from within their Document Management System environment using the same interface.

Most Document Management Systems include mail linking capabilities so that documents can be referenced inside a mail message. Users of cc:Mail, Lotus Notes, Microsoft Mail, and WordPerfect Office can use the routing capabilities in a mail system for basic ad hoc workflow.

Consulting Services: Document Routing With Comprehensive Workflow Packages

Federal agencies are reinventing their internal procedures and applying technology in order to retool with technology and streamline their methods of doing business. Exhibit III-4 profiles an application for integrating organization documents. An agency examining its workflow systems and methods of operation must analyze (at a minimum) the following critical issues:

- Structured Analysis of the Business or Operational Function

- Systems Integration of Component Packages

- Networking & Telecommunication

- Database Strategy

- Hardware Requirements & Procurement.

Exhibit III-4

Federal Agency Opportunities for Document Management

Capabilities	Text Storage & Retrieval
Applications	Vertical & Horizontal Legacy Applications
	Workflow
	Navigation
	Multimedia
Services	OCR
	Optical/Mass Storage
	Image Processing
	Printing
	Information Integration
Platforms	Databases—Relational and Object-Oriented
	E-Mail Transports
	Client/Server—Hardware, Networks

Source: INPUT

L

Categorization of Agency Document Management Applications

Exhibit III-5 profiles categories of document management application. Three different units of work are addressed in terms of completion time and key features and functions.

Exhibit III-5

Agency Transaction Processing/ Production

Unit of Work	Item, Inquiry from Agency or Public
Completion Time	Monitored and Timed in Minutes and Seconds
Key Features & Functions	Host/ Database Access
	Simultaneous Access
	Work Prioritization
	Workload Balancing
	ICR/OCR Support
	FAX Gateway
	Audit Function Applications
	Correspondence Tracking
Examples	PC DOCS
	FileNet WorkFlo
	IBM Image Plus/FAF or WAF
	Recognition/Plexus FloWare, etc.
Completion Time	Negotiated over Days and Weeks
Key Features & Functions	Navigation
	Group Communication
	Annotation
	News Filtering
	Scheduling
	Information Retrieval
Examples	Lotus Notes
	Colabra
	Oracle

Examples	Novell, Microsoft, etc.
Unit of Work	Manual; Documentation
Completion Time	Deadline Oriented over Days and Weeks or Months
Key Features & Functions	Formatting, SGML Markup Version Control Abstracts Print on Demand Page Integrity Graphics Multiple Object Support
Examples	Documentum Interleaf RDM Odesta ODMS Action Workflow Watermark, etc.
Unit of Work	Form; Authorization
Completion Time	Policy Dictated; Days
Key Features & Functions	Transport/Gateway Data Extraction Directory Services Electronic Signature Field Restrictions Message Tracking
Examples	JetForm Delrinia FormFlow BeyondMail ActionFlow Watermark Novell, Microsoft etc.

Source: INPUT

Electronic Commerce, Electronic Publishing & Distribution

Several mediums will dominate electronic document distribution within the federal government over the next three years:

- **Public Networks: Internet and the World Wide Web.** The Internet is a global, public network, allowing commercial, government, non-profit and academic organizations to communicate electronically. The Internet provides many services, including mail (SMTP), file transfer (FTP), document browsing (Gopher) and hypertext (World Wide Web). World Wide Web offers the most robust document browsing environment on the Internet, and has many graphical tools, such as NCSA Mosaic, that make Internet access simple.

- **Electronic Paper and CD ROM: Adobe Acrobat & Other Viewers.** Electronic paper viewers such as Adobe Acrobat allow users to view the document just as it would be seen on a piece of paper. This is very similar to scanning and viewing a document with an image software such as Watermark Professional. However, the document retains the text and formatting in machine-readable format. With Acrobat, the document can be searched accurately using a full text engine such as Verity's Topic. Adobe Acrobat's PDF (Postscript Display Format) files are perfect for the CD-ROM medium; the reader can search for, view, and print the document from a single file format with one low-cost document viewer.

M

Document Management Software Interchange for World Wide Web

Customers who need to provide a public, electronic means to publish their documents may do so on the World Wide Web. The World Wide Web is a set of interconnected servers that contains hypertext documents. The Internet is used for communications between the World Wide Web hypertext browse—such as Mosaic or NetScape—and the various Web servers available over the Internet. By converting documentation to the Web's Hypertext Markup Language (HTML) document format, any Web browser can view that document.

N
Graphical Web Browsers

Pictured below in Exhibit III-6 is an example of an HTML document displayed with NetScape™, a popular Web browser.

Exhibit III-6

Example NetScape™ Screen
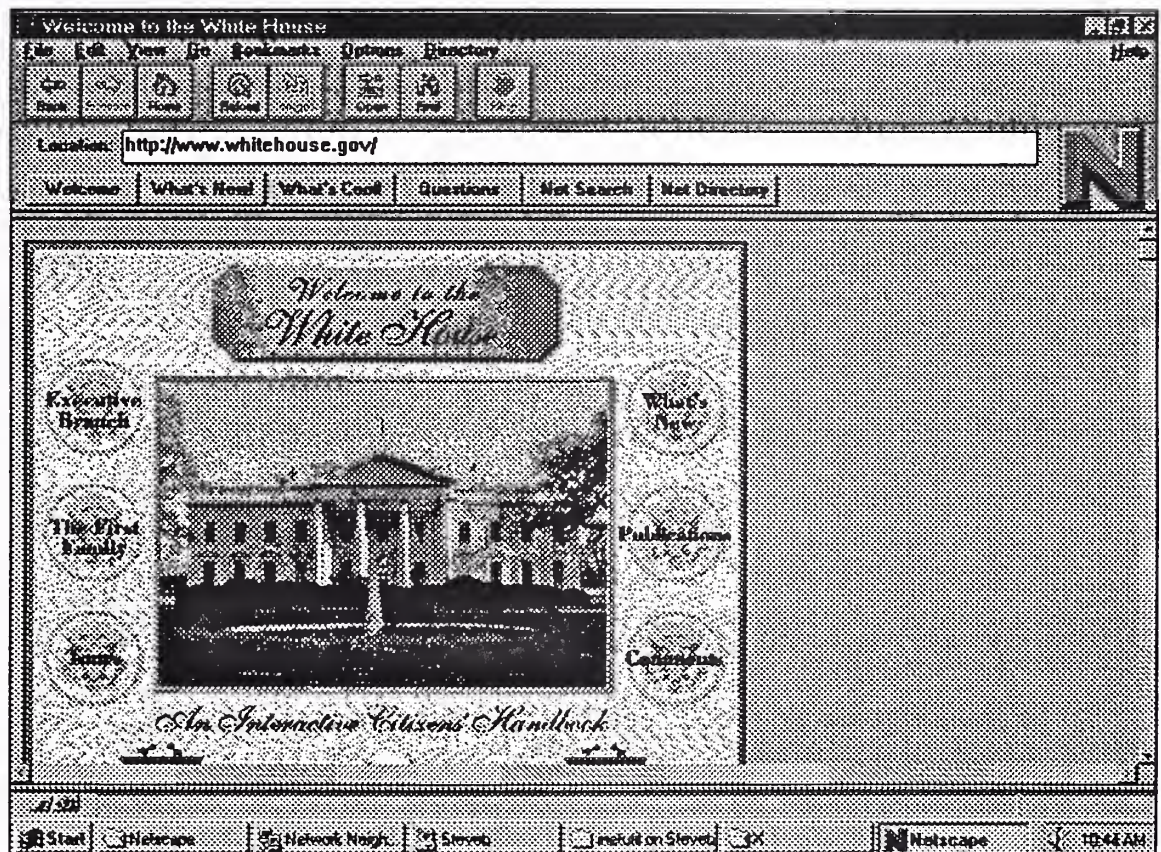
Source: INPUT

Graphical Web browsers can display text and hypertext links intermingled with graphics, audio and even video. In most situations, users need only touch the mouse to access gigabytes of text and multimedia. In the example above, NetScape is displaying graphics and formatted text on a single screen. Also notice that there are links to other pages within the PC DOCS Web server. These documents are accessed simply by pointing at the sentence with the mouse, and clicking; no typing is required.

HTML

HTML is a simple ASCII representation of a compound document. It allows for simple style settings (Heading 1, Heading 2, Body, etc.)

and the inclusion of graphics. As the name infers, HTML allows each document to reference other documents, even if they exist on Web remote servers. Hypertext links allow the user to use a mouse to point at a "hotspot" in the document, such as a graphic or underlined word or phrase, and jump to another document, or even to another Web server.

Publishing On The Web Can Be Time-Consuming

While many agencies are excited about the possibilities of using the Web to publish their documentation, they also are finding out how difficult it can be to manage that process. Many systems integration firms have developed lucrative consulting contracts assisting agencies in obtaining access to the Web. Many things must be done:

- Each group in the agency must determine what documentation they want to place on the Web.

- Management must authorize the documents as those which can be public, and make sure that the contents of each document are ready for public consumption.

- Someone must manually locate and convert the current version of every document to HTML format.

- The HTML files must have hypertext links added, and graphics replaced.

- A logical hierarchical menu of documents must be created as an HTML document.

- Every change to every document must go through this process.

Obviously, it would not take very many documents for this process to become unmanageable. The result is that many Web servers contain fewer than 50 documents, and can be very disappointing to both the user and the publisher.

Evaluating Document Management Systems for Agency Requirements

There are a number of considerations to weigh when working with a government agency in order to determine the correct Document Management System that will meet the agency's requirements. These will help in determining whether the organization requires either a work group or enterprise network solution. These considerations include:

- Electronic or Multi Media Files

- Laser optical storage

- Voice

- Data

- Video

- Text

- Paper.

The area of most confusion to the end user is what constitutes a document. Often, from the user's perspective, the definition is related to the type of file he or she is dealing with in the course of the daily workload. Often, documents are legacy-type files in the form of large volumes of paper or electronic files. However, they could be a voice file or an image file. The common thread is that all of these file types need to be stored, indexed, and retrieved by a common system with seamless integration. These file types include:

- Application Integration

- System Architecture

- Network Performance

- Occasionally Connected Computing Requirements

- Scalability

The proliferation of laptops has created a need to be able to check in and check out files while maintaining version control and authoring capabilities.

Exhibit III-7 provides an overview of the document management integration issue. Relationships among the elements are shown.

The number of users can vary significantly within a work group or an enterprise. The key point to consider is the number of users who will be accessing image files at the same time. LAN/WAN network bandwidth is an important consideration. Image and voice files tend to be significantly larger than electronic documents and can occupy more bandwidth than traditional documents.

Exhibit III-7

Document Management Integration

Network Layer (LAN/WAN)
NetWare, NTAS, Lanman, Dec Pathworks, etc.

Federal Agency Application Area
Electronic Files, Multimedia Files, E-Mail, legacy applications

Document Management Application Integration Front End
Toolkit, Visual C, Visual Basic, etc.

Document Management System
PC DOCS, Soft Solutions, File Net, etc.

SQL Database	Fulltext Database

Source: INPUT

IV
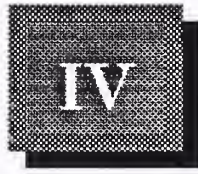
Federal Market Analysis and Forecast

Federal Government Requirements

The federal government is a collection of vertical businesses that share information vertically within components, across components within the same business area, and across different business areas. Document processing is inherent in each business unit and the private sector is contracted to provide initially all document management solutions.

The trend toward downsizing in federal agencies will impact document management systems. With document management technology, faster and more versatile administrative systems will be utilized when there are not the employees to be used for sorting, clipping and filing the incoming and outgoing paper. Most documents produced by federal agencies originate in an electronic format. Image processing technology is used in two-thirds of all federal agencies for reengineering text and document management projects. Exhibit IV-1 shows the Document Management Systems Market growing from $.8 Billion in 1995 to approximately $1.2 Billion in FY 2000, a 7% CAGR.

Document Management Systems, FY 1995–2000
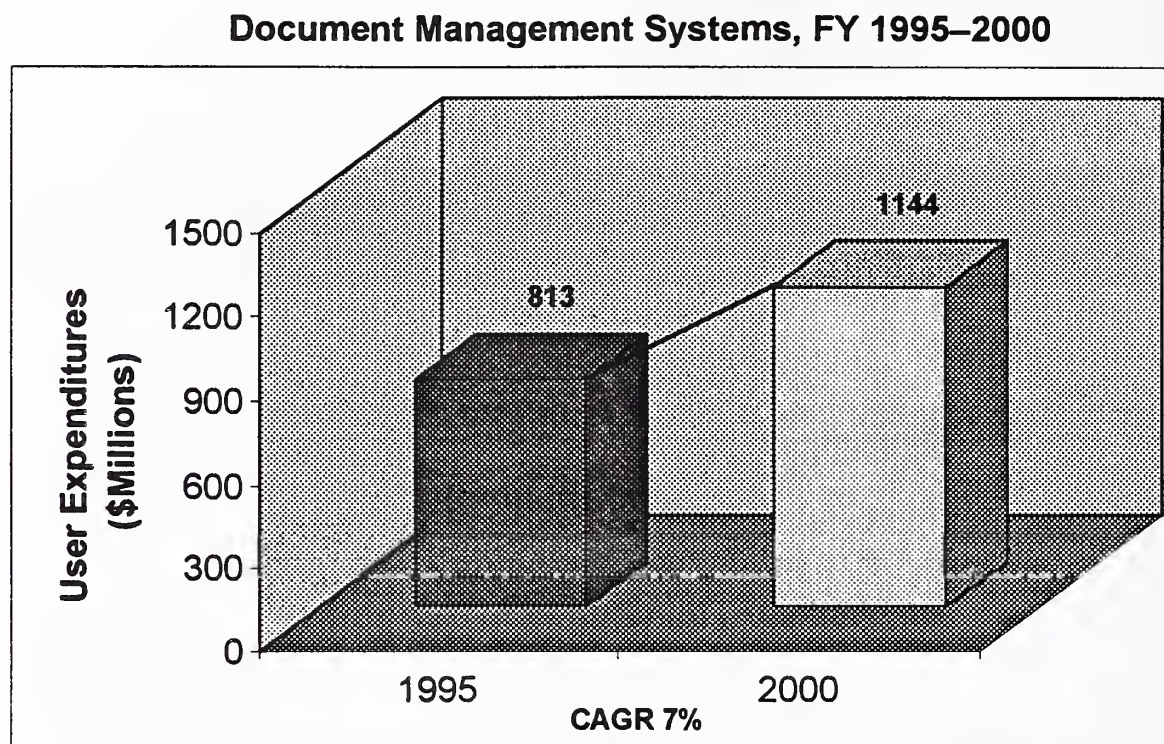
Source: INPUT

Workflow will be a major component of the document management system solution. New imaging technologies in the workflow arena are making repetitious workflow obsolete. Workflow software is considered an extension to document and image management that lets successive operations be performed at various stations on the network as it flows through a specific process. Document management systems are intended to give users multiple, non-hierarchical methods to store and retrieve unstructured data such as word processing files, graphics and spreadsheet files. High-end document management systems are designed for imaging and archiving documents in large volumes. Other systems interact with SQL-based relational DBMs at client/server sites, adding workflow capabilities. SGML will have a major effect. When documents are encoded using SGML, it is possible to break the documents down into smaller, discrete chunks that can be edited independently of other parts of the document. This independence provides a finer degree of control in managing different configurations and versions of the document elements and documents as a whole.

Focus in the government still will be on component software. Document management software will enable organizations to store, organize and edit volumes of information and will include support for a variety of data types including images, sound, text and video.

Civilian agencies will outspend DoD significantly in all categories, i.e. professional services, hardware and maintenance, except software

products. The spending for civilian agencies is well above that of DoD except in the software products category. However, the growth rate in the civilian agencies is 8% compared to 2% in DoD.

The following Exhibit IV-2 and Exhibit IV-3 show the Defense and Civilian Document Management Systems Markets, respectively, for FY 1995–2000.

Exhibit IV-2

Defense Document Management Systems, FY 1995–2000
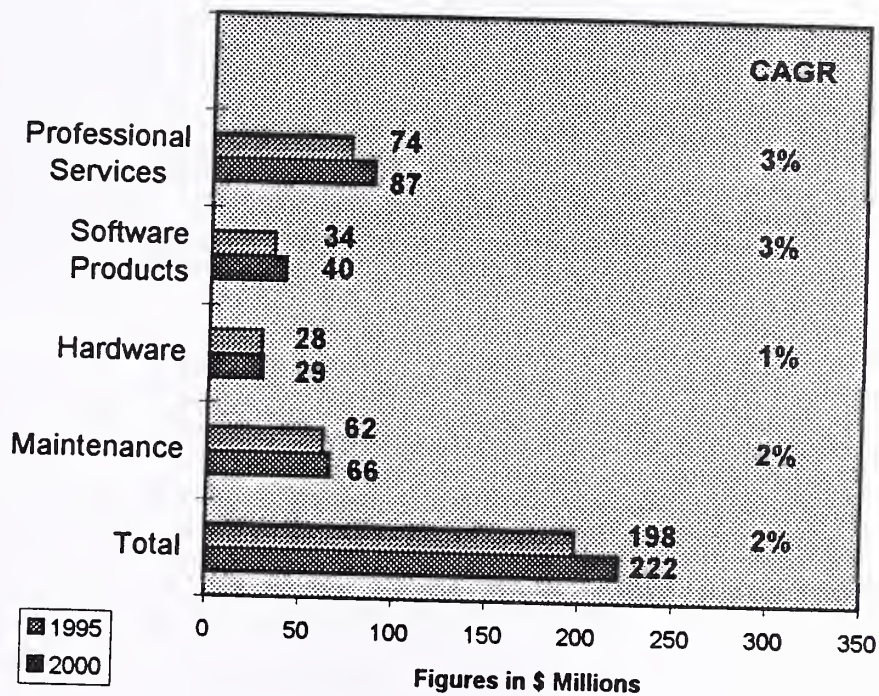
Source: INPUT

Exhibit IV-3

Civilian Document Management Systems, FY 1995-2000

	CAGR
Professional Services	279 / 403	8%
Software Products	36 / 54	9
Hardware	174 / 300	11%
Maintenance	123 / 164	6%
Total	615 / 921	8%

■ 1995
⊠ 2000

0   200   400   600   800   1000   1200   1400

Figures in $ Millions
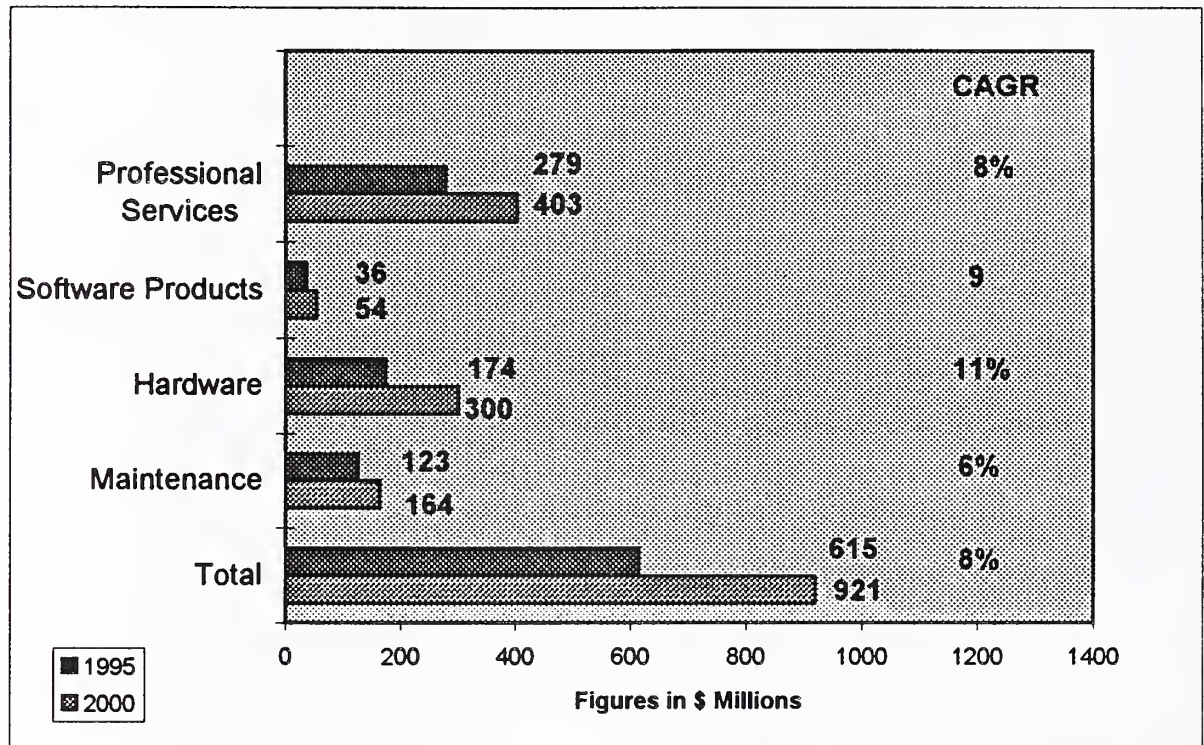
Source: INPUT

Exhibit IV-4 synopsizes recently awarded Document Management Opportunities within the federal government. It provides a characterization of recent business opportunities found within federal agencies. It lists the opportunities by agency, by program, and by the type of application, i.e., document management, imaging, as well as the types of services associated with these applications.

Exhibit IV-4

Recently Awarded Document Management Opportunities

Department	Agency	Program	Acronym	Document Tracking	Image Systems	Open Systems	Systems Integ.	Professional Services	Network Services
AGRICULTURE	Bureau of Land Management	Correspondence Tracking		Yes	Yes	No	Yes	Yes	Yes
COMMERCE	Census	Electronic Image Forms Processing Software		Yes	Yes	No	Yes	Yes	Yes
DEFENSE	Air Force	Joint Stars Paperless Automated Depot	JPAD	Yes	Yes	No	Yes	Yes	Yes
DEFENSE	Air Force	Imaging Simulation Modeling	ISME	No	Yes	No	Yes	Yes	No
DEFENSE	Air Force	Automated Records Mgmt.	AFCAC 306	Yes	Yes	No	Yes	Yes	No
DEFENSE	Air Force	Configurations & Data Mgmt. Support Services	CM/DM	No	No	No	No	Yes	No
DEFENSE	Air Force	Office Automation & Relational Database Mgmt. System Software	OA/RDBMS	No	No	No	No	Yes	Yes
DEFENSE	Air Force	Optical Disk Imaging Sys.		Yes	Yes	No	Yea	Yes	No
DEFENSE	Army	Integrated Library Sys.		No	No	No	Yes	Yes	Yes
DEFENSE	Army	Personnel Electronic Records Mgmt.	PERMS/ODIS	Yes	Yes	No	No	Yes	Yes
DEFENSE	Army	Defense Medical System Support Ctr. Automation Support Hardware	DASH	No	Yes	No	No	Yes	Yes
DEFENSE	DIA	SASS/COTS Software	SASS	No	No	No	No	Yes	No
DEFENSE	DISA	Joint Information Mgmt. Support Systems	JIMS	No	No	No	No	Yes	Yes
DEFENSE	DLA	Defense Auto. Addressing Systems ADPE Replacement Program	DARP	No	No	No	No	Yes	Yes
DEFENSE	DISA	Joint Information Mgmt. Support Systems	JIMS	Yes	No	No	Yes	Yes	No
DEFENSE	Navy	Automated Document Management and Publishing Sys.	ADMAPS	Yes	Yes	Yes	No	Yes	No
DEFENSE	Navy	Technical Manual Publish-On-Demand Sys.	TMPODS	No	No	No	Yes	Yes	No
DEFENSE	Navy	Library Management Information Sys.		No	No	No	Yes	Yes	No
EDUCATION	Office of Management	Office Automation Support Services		No	No	No	No	Yes	Yes
EDUCATION	Office of Operations	National Student Loan Data Systems	NSLDS	No	No	No	No	Yes	No

Exhibit IV-4 (continued)

Recently Awarded Document Management Opportunities

Department	Agency	Program	Acronym	Document Tracking	Image Systems	Open Systems	Systems Integ.	Professional Services	Network Services
EDUCATION	Office of Operations	Pell Grant Recipient and Financial Management		No	No	No	No	Yes	No
EDUCATION	Office of Operations	Federal Direct Student Loan Program	FDSLS	No	No	No	No	Yes	No
ENERGY	Albuquerque Operations	Automated Procurement Express Systems	APES	No	Yes	No	Yes	No	Yes
ENERGY	Energy Information Administration	Facilities Management	EIAFM	No	No	No	No	Yes	No
ENERGY	Civilian Radioactive Waste Mgmt.	Licensing Support System	LSS	Yes	No	No	Yes	Yes	Yes
EQUAL OPPORTUNITY		Relational Data Base Management. System	RDBMS	Yes	Yes	No	No	No	No
HEALTH & HUMAN SVCS.		Child Support Enforcement Nat'l. Communications Network	CSENET	No	No	No	No	Yes	Yes
HEALTH & HUMAN SVCS.		Clinical Data Abstraction Centers	CDAC	No	No	No	No	Yes	No
HEALTH & HUMAN SERVICES	Social Security Administration	IWS/LAN Workstation Acquisition Phase I	IWS/LANI	No	No	No	Yes	No	Yes
HEALTH & HUMAN SVCS.	Social Security Administration	Medicare Transaction Systems	MTS	No	No	No	No	Yes	No
INTERIOR	Forest Service	Correspondence Tracking		Yes	Yes	Yes	Yes	No	No
INTERIOR	Bureau of Land Management	LAWNET Software, Hardware, & Support	LAWNET	No	No	No	Yes	Yes	No
JUSTICE		Automated Central Intake Facility	NCIF	Yes	No	No	Yes	Yes	Yes
JUSTICE		Automated Litigation Support	ALS	Yes	Yes	No	No	Yes	No
JUSTICE	FBI	FOIPA Document Processing Systems	FDPS	No	Yes	No	No	Yes	Yes
JUSTICE	FBI	Fingerprint Image Conversion Operation	FICO	No	Yes	No	No	Yes	Yes
JUSTICE	FBI	IAFIS Automated Fingerprint ID System	AFIS	No	Yes	No	No	Yes	Yes
JUSTICE	Justice Mgmt. Division	Justice Consolidated Office Network Commodity Contract	JCON CC	No	No	No	No	No	No

Exhibit IV-4 (continued)

Recently Awarded Document Management Opportunities

Department	Agency	Program	Acronym	Document Tracking	Image Systems	Open Systems	Systems Integ.	Professional Services	Network Services
NRC	Nuclear Regulatory Commission	Text Retrieval System	TRS	Yes	No	Yes	Yes	No	Yes
NRC	Nuclear Regulatory Commission	Nuclear Documents System	NUDOCS	Yes	Yes	No	No	Yes	No
STATE		Office Automation Recompetition	SOAR	Yes	Yes	Yes	Yes	Yes	Yes
STATE	Consular Affairs	Travel Document Issuance System	TDIS	Yes	yes	No	Yes	No	No
TREASURY		Turnkey or Integrated Document Management Workflow		No	Yes	No	No	Yes	Yes
TREASURY	IRS	Document Processing Systems	DPS	Yes	Yes	No	Yes	Yes	Yes
TREASURY	IRS	Optical Character Recognition/Remittance Processing Sys.	OCR/RPS	No	Yes	No	Yes	Yes	Yes
TREASURY	United States Customs Service	INC Document Reader		No	Yes	No	Yes	Yes	Yes
VETERANS AFFAIRS		Document Management Systems	DMS	Yes	Yes	No	Yes	Yes	Yes
VETERANS AFFAIRS		Nationwide Office Automation	NOAVA	Yes	Yes	No	Yes	Yes	Yes

Of the contracts listed in Exhibit IV-4, fewer than half contain document tracking requirements. Exhibit IV-5 tabulates the information in Exhibit IV-4. Given the growing requirement in the government to manage compound documents, the state of existing contracts does not indicate strong support for other than internal document storage and retrieval.

A strong correlation exists for the inverse of open systems requirements and personal services. The less the requirement for open systems solutions, the greater the requirement for personal services. The low number of contracts into open systems requirements is surprising, but if systems are standalone, serving only a local office, open requirements may not be important.

As many contractors are part of systems integration (21) as not (25), but as many require network services (22) as not (24).

Exhibit IV-5

Tabulation of Awarded Federal Document Management Contracts

	Document Tracking	Image	Open	SI	PS	NS
Total						
Yes	20	20	6	21	39	22
No	26	26	40	25	7	24
N=46						
DoD						
Yes	6	7	1	8	16	7
No	10	9	15	8	0	1
N=16						
CLV						
Yes	14	13	5	13	23	15
No	16	17	25	17	7	15
N=30						

Source: INPUT

A

Agency Profiles

The actual and planned implementations of Document Management Systems in three agencies were reviewed to try to gain an understanding of both work group requirements and agency-wide requirements.

1. U.S. Department of Agriculture

a. Background

The mission of the Department of Agriculture is to develop and administer the agricultural and land use policies of the United States. It is an organization that is very large and represents 25% of the budget. Many of its programs cross agency boundaries and deal with the formulation and implementation of legislation. They range from farm support programs to surplus food programs. In addition, the Department of Agriculture supports a number of research programs dealing with the production of food supplies. As a result, inquiries for information will come from other agencies, the White House, Capitol Hill, or the private sector. There are many "sign off" authorities and reviews that a document must undergo before it is released.

b. Significance of Document Management Systems

At the headquarters level, the department has undertaken a number of system reengineering studies in order to meet the challenges the agency faces. One of these challenges is downsizing as faced by many other agencies. The department is required to archive all correspondence documents in a central repository. Plans are underway to replace this system as part the information share program. This procurement was protested last year and implementation has been delayed. Any new system must have the capability to retrieve documents from this repository.

c. Investment in Current DBMS Systems

There are a number of mainframe DBMS systems that allow client server access that supports the operation of the organization. These range from Inquire to Oracle, to name only two. Many vendors are proposing application solutions that will build on the investment the agency has made in these systems. For example, workflow solutions that are tightly integrated with Oracle have been proposed by a number of companies.

d. Integration with Legacy Systems

Because the agency deals with policies, many of its systems are paper based and, therefore, prime candidates for a combination of workflow, document management and imaging systems. Many of these processes and systems are being streamlined to interface with existing systems. The target applications are not being integrated into an agency-wide solution until the agency's hardware procurement has been accomplished. Until then, the department desktop architectures will not be interfaced into other application areas.

However, in selecting solutions, the agency focuses on "Open Systems" in order to have the most flexibility.

e. Open Systems Requirement

The department intends to take advantage of any productivity gains and cost savings by using new advanced technologies that are "Open" in nature.

f. Supporting Technologies

The department is committed to upgrading all of its PCs to 486s. It most likely will migrate to a UNIX-based systems network with applications running in a Windows or X-Windows environment, still allowing interconnectivity to Novell based networks that are already in place.

2. Department of Veterans Affairs

a. Background

Many of the VA's medical centers are automating their medical records systems into a paperless environment. The VA is requiring COTS solutions that will organize, store and retrieve files and documents quickly. The department requires document imaging, text retrieval and workflow as part of its solution.

b. Significance of Document Management

Each hospital has a decentralized computer that is used as the central repository of document data. The new systems that are purchased must interface with the database and must store both pictures and document images as well as full text. These systems will streamline the method of storing and retrieving documents, as well as route them throughout the organization.

c. Investment In Current DBMS Systems

The organization will not allow the new systems to jeopardize the desktop publishing (DTP) environment by entering data directly into the DHCP system, thus maintaining the integrity of historical data.

d. Open Systems Requirement

An open system approach has been mandated with the following minimum tools:

- Dynamic Library Link (DLL)

- Object Link Embedding (OLE)

- Dynamic Data Exchange (DDE)

- C++ Programming Language (C- API)

- Macro Language

- Workflow

- Data Dictionary.

3. U.S. Department of the Interior

a. Background

The Department of the Interior has responsibility for nationally owned public lands and natural resources. Within this jurisdiction, Interior handles the conservation and development of mineral and water resources, management of revenue from Federal and certain Indian mineral leases and coordination of Federal and State recreation programs.

b. Significance of Document Management Systems

The Division of Information Resources Management (IRM) for the U.S. Fish and Wildlife Service has been directed to conduct a detailed analysis of the functional, technical and resource requirements of the Service wide Document Management System. A 20-person requirements analysis team was formed to consider functional and scoping issues, while the office of IRM researched the technical and funding issues. The findings of these analyses, together with IRM's recommendations and possible alternatives are available in a Draft Report issued July 14, 1995. Key findings included:

    i. Top capabilities requirements for a Document Management System are:

- *Document approval (Surnaming)* - ability to review and indicate approval of documents on the system

- *Security and Access* - ability to establish security and access to individual documents

- *Electronic library and document sharing* - ability to search, retrieve, view and print documents, regardless of software and storage technologies.

- *Tracking Process* - ability to have automatic tracking of information, including the creation, editing, viewing, and printing of documents.

b. Types of documents identified as having highest priority included:

- Budget documents

- Letters/correspondence

- Memoranda

- Briefing papers

- Agency directives

- Work activity guidance.

c. Investment in DBMS Systems

Through the exercise of greater discipline in the use of existing resources, i.e., E-Mail, and network file directories, a rudimentary Service wide "document management" system could be implemented with no additional expense for hardware or software. However, users would need to be trained in how to share and retrieve documents in the system. The assessment of the requirement team stated that at least some DMS capabilities are essential.

d. Integration with Current Operations

Cost and resource requirements have not been estimated for all of the functions of the Document Management System. A further study of the process is being conducted to determine the planned functional requirements and implementation schedule of the recommendations that were accepted by the requirements analysis team and reported to the Service.

B
Agency Planning Overview

Exhibit IV-6 provides an overview of future civilian agencies planning Document Management Systems, broken out by agency and technology format.

Exhibit IV-6

Overview of Civilian Agencies Planning Future Document Management Systems

Department	Agency	Doc Mgmt.	Workflow	Multimedia	CD-ROM
Energy	NRC	x	x	x	x
Executive	OMB	x	x	x	x
	EOP	x	x	x	x
HHS	Social Security	x	x	x	x
	HCFA	x	x	x	x
VA	Vet. Cemeteries	x	x		
	Affairs	x	x		
DOT	FAA	x	x	x	x
	Highway Admin.	x	x		
Library of Congress		x	x		
EPA		x	x	x	x
GSA		x	x	x	x
Treasury	IRS	x	x	x	x
NITS		x	x	x	x
DOJ	FBI	x	x	x	x
	Bureau of Prisons	x	x		
	Attorney General				
	Anti Trust	x	x	x	x
Agriculture	Forest Service	x	x		
	Administration	x	x		
Interior	Land Mgt.	x	x	x	x

Source: INPUT

Corresponding Exhibits IV-7 and IV-8 show Document Management, Workflow, Software Vendors and Software products that can be influential in meeting the needs of the Agency requirements. Appendix A of this report provides a list of opportunities with program values and RFP data to complement these Exhibits.

Exhibit IV-7

Document Management, Workflow Software Vendors

Vendor	Product
PC DOCS	PC DOCS
FileNet	FileNet
Soft Solutions	Soft Solutions
Excalibur	Excalibur
Plexus	Plexus
IBM	ImagePlus
Wang	WIIS
ViewStar Corp.	ViewStar
Image Fast Software Inc.	Image Fast
Blue Ridge Technologies	MX6000

Source: INPUT

Exhibit IV-8

Document Management, Workflow Software Products

Vendor	Software
Action Technologies	ActionFlow
Reach	Reach
FileNet	WorkFlo
Odesta	Odesta

Source: INPUT

V
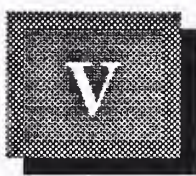
Summary

This survey indicates that the Document Management Market within the federal sector is expanding greatly as technology is advancing. The processing power of PCs, new application software and networks is now allowing the PC to be used for information gathering and sharing rather than purely word-processing and spreadsheet functions.

Document Management Systems now are combining imaging systems, workflow, and electronic publishing systems into total solutions for the work group and the entire enterprise. They are allowing agencies to re-engineer their functions and allow for down sizing while increasing the services they provide to other agencies and the general public.

The Federal government is well on its way to implementing a strategy of purchasing component software solutions. This trend benefits the agency by reducing software implantation and maintenance costs. It also forces more competition within the procurement process because multiple systems integrators can provide the same software solution.

Companies looking to provide Document Management Solutions to the Federal Government find themselves having to become authorized value-added resellers of multiple products. As a cost of entry into the business they have to consider the following:

- Invest in the training of a technical staff that is authorized to implement the vendor's document management software.

- Maintain a technical staff that can implement systems in an "Open Systems" environment.

- Maintain a technical staff that can operate in a multiple operating system environment—i.e., DOS, Windows, UNIX, MAC and DEC Pathworks, etc.

- Learn prototyping techniques with integrated component built systems utilizing the vendor's API. These usually require Visual Basic and Visual C++

- Maintain a technical staff that is capable of implementing LAN/WAN based solutions

- Maintain a technical staff that is capable of handling text data formatting and is proficient in SGML markup for electronic publishing.

The margins for the resale of the component software may be diminished by the increased competition. The professional service component margin of the sales is increased. Higher margins and billing rates are often attainable due to the vendor certification requirement of the staff. In addition, the systems require a more front end analysis and definition of end-user requirements. This usually requires the utilization of more senior-level personnel.

Because many of the agency solutions start out being work group based in support of Legacy based applications, many of these opportunities can be gained by small business and 8A set asides. The major prime vendors can use these procurement advantages as a result of recent set aside changes.

A
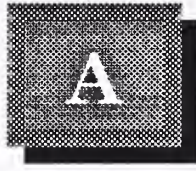
Federal Opportunities

The following are programs within the federal government providing Document Management System opportunities The programs listed here are in the pre-RFP procurement stage. There are other DMS opportunities that are currently in more advanced procurement stages, such as the Department of Transportation's Electronic Document Management System. This program is expected to be awarded in December 1995. For more information regarding opportunities in the later stages of the procurement cycle, contact INPUT's offices at 703-847-6870.

Document Management Systems Opportunities

AGENCY	PROGRAM	VALUE	RFP DATE
DISA	Joint Information Mgmt. Support System		4Q95
DMA	Global Geospatial Mapping Information Services		1Q96
Army	Command Information Management System		1Q98
Army	Budget Management Information Support Services	$5–7M	4Q97
Navy	Procurement Corporate Information Management Standard Procurement System		4Q95
Air Force	Intelligence System Support	$5M	1Q98
Marine Corps	Support for Analysis of Flight Data Recorders	$10M	1Q96

Justice	Information Technology Support Services		1Q96
Justice	Automated Nationwide Central Intake Facility Support Services	$5M	2Q98
Justice	Joint Automated Booking Station		1Q97
Justice	Facilities Management and Production of Immigration Card Facilities		4Q95
Justice	Consolidated Office Network Commodity Contract	$40M	3Q96
Education	Pell Grant Recipient and Financial Management System	$35M	1Q97
Energy	Automated Procurement Express System		1Q96
Energy	Licensing Support System	$200M	3Q96
HHS	National Library of Medicine Modernization		2Q96 (RFI)
HHS	NIOSH Information Technology Systems Support Services		4Q95
HHS	ADP Support Services for the Center for Intramural Research	$15M	2Q97
Interior	Distributed Information System III		1Q08
Interior	Earth Resources Observation System Data Center	$48M	3Q96
NASA	Center for Aerospace Information		1Q97
Commerce	Automated Procurement System Software		
Commerce	Census Data Capture System 2000		3Q96
State	Office Automation Recompetition		1Q98
Treasury	INC Document Reader		1Q96
Transportation	Automated Documentation Development and Maintenance System		4Q95
Transportation	FSAS Operational and Supportability	$90M	2Q96

	Implementation System (OASIS)		
Transportation	Office Automation Technology and Services		2Q96
US Courts	Integrated Library System		1Q96
Veterans Affairs	Patient ID Card Production System		

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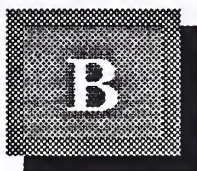
Federal Clearing House Libraries

A

List of Libraries with Contact Names and Descriptions

Educational Resource Information Center (ERIC)

Office Of Educational Research And Improvement

Department Of Education

Contact Point:

Keith Stubbs

Education Information Resources Division

202-219-1547

Description:

Provides teachers, administrators, researchers, librarians, policy makers and teachers with access to educational information resources. Operates the largest educational information system in the world.

National Clearing House For Alcohol And Drug Information

Substance Abuse And Mental Health Services Administration

Department Of Health And Human Services

Contact Point:

Lew Eigen

Director of NCADI

301-496-6921

Description:

Serves as clearing house for information and materials on alcohol and other drugs.

National Library Of Medicine

Department Of Health And Human Services

Contact Point:

Lois Ann Colaianni

Director of Library Operations

301-496-6921

Description:

Serves as the nation's chief medical information library and information source.

National Agricultural Library

U.S. Department Of Agriculture

Contact Point:

William Feidt

Branch Head of Library Automation

NAL Information Systems Division

31-504-6813

Description:

Provides agricultural information and clearing house services to users ranging from scientists to the general public.

Communications And Computer Operation Support Services

Air Force Contracting Office:

Contact Point:

Cindy Schwuibold

Contract Negotiator

Department of the Air Force

Operational Contracting Division

1940 Allbrook Drive, Suite 3

Wright-Patterson AFB, OH 45433-5309

513-257-4872

Description:

The Department of the Air Force has a requirement for Automatic Data Processing (ADP), Teleprocessing/Data communications, and related services in support of the Information Systems and Technology Center (ISTC). The ISTC is an information processing and computer facility that offers communication and computer system support to the ASC community of scientists, engineers, logisticians and managers.

Office Of Presidential Libraries

National Archives And Records Administration

Contact Point:

John Fawcett

Assistant Archivist

202-501-5700

Description:

Collects papers and records from past Administrations and makes them available to the public. There is a library for each administration since that of Herbert Hoover. Currently, there are 11 libraries.

Federal Records Centers

National Archives And Records Administration

Contact Point:

David Peterson

Assistant Archivist

301-713-7200

Description:

As federal agencies retire noncurrent records, the federal records centers provide low-cost storage. These centers also provide reference services, including loans, record reproduction and other information retrieval services.

Smithsonian Institution Libraries

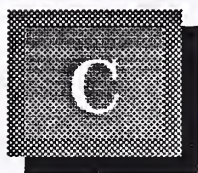### Smithsonian Institution

Contact Point:

Vija Karklins

Manager of Systems and Technical Services Division

202-357-2240

Description:

The libraries hold roughly 1.1 million volumes with strengths in natural history, museology, science and humanities.

C

Glossary of Acronyms

Abbreviations and contract terms that INPUT encountered most frequently in program documentation and interviews for this report are included, but this glossary should not be considered all-inclusive. Federal agency abbreviations have been included to the extent that they are employed in this report.

ADP	Automated Data Processing
API	Application Programs Interface
CIM	Corporate Information Management
DDE	Dynamic Data Exchange
DDL	Dynamic Library Link
DISA	Defense Information Systems Agency
DMA	Defense Mapping Agency
DMS	Document Management System
DoD	Department of Defense
DQI	Department of Interior
EDI	Electronic Data Interchange
FDA	Food and Drug Administration
GSA	General Services Administration
HTML	Hypertext Markup Language
LAN	Local Area Network

ODBC	Open Data Base Connectivity
ODMA	Open Document Management Application
OLE	Object Link Embedding
OMB	Office of Management & Budget
PDF	Postscript Display Format
RDBMS	Relational Data Base Management System
SETA	Systems Engineering & Technical Analysis
SO	Systems Operations
SQL	Structured Query Language
USDA	U.S. Department of Agriculture
WAN	Wide Area Network